

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference  IP/P3225/WOD	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No.  PCT/GB 03/03512	International filing date (day/month/year)  11/08/2003	(Earliest) Priority Date (day/month/year)  13/08/2002
Applicant  QINETIQ LIMITED		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 5 sheets.  
☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).
3. ☐ **Unity of Invention is lacking** (see Box II).

**4. With regard to the title,**

- ☐ the text is approved as submitted by the applicant.
- ☒ the text has been established by this Authority to read as follows:  
**PHORETIC DISPLAY DEVICE WITH LIQUID CRYSTALLINE SUSPENSION MEDIUM, AND MANUFACTURING METHOD**

**5. With regard to the abstract,**

- ☐ the text is approved as submitted by the applicant.
- ☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

**6. The figure of the drawings to be published with the abstract is Figure No.**

- ☒ as suggested by the applicant.
- ☐ because the applicant failed to suggest a figure.
- ☐ because this figure better characterizes the invention.
- 5 ☐ None of the figures.

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/GB 03/ 03512

## Box III TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)

A phoretic display device comprising a plurality of electrophoretic or magnetophoretic cells, each having a phoretic particle (6) dispersed within a suspension medium (7) comprising a liquid crystal material (20). The phoretic cell is adapted to induce defects (21), Sometimes known as disclinations, in the alignment of the liquid crystal material (20) within the cell which act to exert a retentive force on the phoretic particle (6) when within the region of influence of the defects (21). The configuration of the display introduces a threshold level in the electric or magnetic field required to move the phoretic particle (6) between defects (21) within the cell. Accordingly, the non-linear electro-optic or magneto-optic behavior of the display facilitates matrix addressing of the cells therein. The display may comprise a plurality of prolate spheroid phoretic cells arranged in an encapsulant the major (long) axis of each cell arranged substantially perpendicular to the plane of the display.

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International Application No  
PCT/GB 03/03512

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 G02F1/167 G02F1/1334 G02F1/1337

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 G02F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC, COMPENDEX, IBM-TDB

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 98 41899 A (MASSACHUSETTS INST TECHNOLOGY) 24 September 1998 (1998-09-24)  page 16, line 16 - line 26; figures 3B,C page 19, line 10 - line 17; figures 4C,D page 22, line 27 - page 23, line 4; figure 7A  ---	1-5, 19-22, 33,43, 44, 47-50, 52,53
A	US 4 305 807 A (SOMLYODY ARPAD) 15 December 1981 (1981-12-15) cited in the application  the whole document  ---  -/--	1-5,32, 33,35, 41,42, 47-50

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*g\* document member of the same patent family

Date of the actual completion of the international search

26 November 2003

Date of mailing of the international search report

03/12/2003

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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/GB 03/03512

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>TERENT'EV E M: "Moment theory of elasticity and interaction of disclinations in liquid crystals" KRISTALLOGRAFIYA, MARCH-APRIL 1987, USSR, vol. 32, no. 2, pages 288-296, XP009021685 ISSN: 0023-4761 section 3</p> <p>-----</p>	1

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 03/03512

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9841899	A	24-09-1998	US 5961804 A	05-10-1999
			AU 6759698 A	12-10-1998
			BR 9808277 A	16-05-2000
			CA 2283752 C	21-10-2003
			EP 0968457 A2	05-01-2000
			JP 2001516467 T	25-09-2001
			TW 459159 B	11-10-2001
			WO 9841899 A2	24-09-1998
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US 4305807	A	15-12-1981	NONE	
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